UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/055,613	01/25/2002	Samir Gupta	4062-14	4948

7590 05/19/2003

NIXON & VANDERHYE P.C.
8th Floor
1100 North Glebe Road
Arlington, VA 22201

EXAMINER
PARKER, FREDERICK JOHN

ART UNIT	PAPER NUMBER
1762	5

DATE MAILED: 05/19/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.	Applicant(s)
10/055,613	
Examiner	**Group Art Unit**

—The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address—

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

☒ Responsive to communication(s) filed on 3/6/03.

☐ This action is **FINAL.**

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle,* 1935 C.D. 1 1; 453 O.G. 213.

Disposition of Claims

☒ Claim(s) 1-46 is/are pending in the application.

Of the above claim(s) 31-46 is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 1-30 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claim(s) _____ are subject to restriction or election requirement

Application Papers

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner

☒ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119 (a)–(d)

☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119 (a)–(d).

☒ All ☐ Some* ☐ None of the:

☒ Certified copies of the priority documents have been received.

☐ Certified copies of the priority documents have been received in Application No. _____.

☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a))

*Certified copies not received: _____.

Attachment(s)

☒ Information Disclosure Statement(s), PTO–1449, Paper No(s). 4

☒ Notice of Reference(s) Cited, PTO–892

☐ Notice of Draftsperson's Patent Drawing Review, PTO–948

☐ Interview Summary, PTO–413

☐ Notice of Informal Patent Application, PTO–152

☐ Other _____

Office Action Summary

DETAILED ACTION

Election/Restriction

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Claims 1-30, drawn to method, classified in class 427, subclass 250.

II. Claims 31-46, drawn to product, classified in class 428, subclass 469.

2. The inventions are distinct, each from the other because of the following reasons: Inventions I and II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the product can be made by changing the color of the gemstone substrate by applying a lacquer or foil; irradiation; or sputtering a layer followed by heat-treatment at a lower temperature for a longer time period.

3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

4. During a telephone conversation with Larry Nixon and Gwendolyn Blackwell-Rudasill on 12/12/2002 a provisional election was made with traverse to prosecute the invention of group I, claims 1-30. Affirmation of this election must be made by applicant in replying to this Office action. Claims 31-46 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

5. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(I).

Priority

6. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Specification

7. The disclosure is objected to because of the following informalities: the meaning of the relative phrase "thin/thick" (page 8,18 & 26; etc) is unclear since the intended meaning of the thicknesses are not defined, and their meaning would not be apparent to one of ordinary skill. Appropriate correction is required.

Claim Objections

8. Claims 1,10,12,22,24-27 are objected to because of the following informalities: (1) claim 1, line 1, after "mineral", --substrate-- should be added for consistency and clarity; (2) claims 10 and 12, a comma should be inserted on line 2 of claim 10 after "compound" to clearly distinguish members of the Markush Group and line 3 of claim 12 after "material". (3) claims 22,24-27, "oxidised" is mis-spelled. Appropriate correction is required.

Claim Rejections - 35 USC § 112

9.The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claims 1,5 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

- Claim 1 is vague and indefinite because the meaning of the phrase "in an appropriate ambience" does not meaningfully describe the intended conditions for treatment.

- Claim 5 is vague and indefinite because the relative phrase "thick or thin" does not clearly describe the intended thickness, its meaning is undefined, and one of ordinary skill would be unable to ascertain its meaning in context. Since the phrase covers ALL coating thicknesses causing coloration, this is how the phrase will be interpreted for sake of examination.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

13. Claims 1-5,8-13,20-23,26-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pollak WO98/48944.

Pollak teaches to "enhance" (increase or modify) coloration in gemstone minerals by contacting a treating agent with a gem mineral and using thermal/atmospheric conditions to cause the color modification. Finely-divided treatment agents, e.g. cobalt metal or oxides alone or in combination with other metals (transition metals) (page 3, 23-27), are contacted with gemstone minerals such as topaz, chrysoberyl, sapphire, etc per claims 2-3, 10-13. Gems are cleaned prior to treatment by washing in water, solvent, acid, etc per claims 4 and 30. Thermal treatments are in the range of about 825-1050 C for about 3-

200 hours, which overlaps Applicants' ranges. The subject matter as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made if the overlapping portion of the temperature ranges disclosed by the reference were selected because overlapping ranges have been held to be a prima facie case of obviousness, see In re Wortheim 191 USPQ 90. Furthermore, there would have been a cause-effective relationship between treatment time and temperature, such that one of ordinary skill would have recognized that equivalent results can be achieved by using higher temperatures at shorter times, or vice-versa, if damage to the stone can be avoided.

Page 4, 16 to page 5, 20 teaches that coloration of specific minerals can be enhanced by treatment conditions such that, for example, topaz (generally clear to pale pink) can be modified to various shades of blue, green, or blue-green; yellowish chrysoberyl modified to be blue; and clear sapphire can be treated to be light to dark blue per claims 20-23, 28. Color intensity is a function of higher temperature/ longer exposure times. Atmosphere is important in the coloration process as oxygen, reducing agents, etc may also be used to provide a desired coloration per claims 26-27. Treatments result in an agent

being diffused into the lattice of the crystalline gemstone or a coloration agent is bonded (coated) onto the surface of the stone, per claims 8-9 (col. 7, 28-37).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to carry out the method of Pollak on a gemstone mineral by contacting it with an appropriate coloring agent, and varying time/ temperature/ atmosphere conditions because the reference teaches that variations in such conditions provide aesthetically desirable variations in color enhancement of gemstones.

14. Claims 6-7,14-19,24,25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pollak WO98/48944 in view of Webster or Pollak US 2002/0128145 (hereafter, Pollak'145).

Pollak is cited for the same reasons discussed above, which are incorporated herein. Multi-color enhancement and specific additional coloration agents are not taught.

At the outset, the Examiner notes that it is well-known in the mineralogical/ gemstone arts that small amounts of impurities, including metals or metal compounds, in a mineral cause exotic colorations. The physics of such colorations are well-known in the art, and may include ligand field effects,

molecular orbital effects, color centers, etc. Given this level of ordinary skill, Webster and Pollak'145 disclose specific impurity colorants, i.e. 1-3% chromia in the mineral corundum results in the gemstone ruby; 0.1-0.3 % titania in the mineral corundum results in the gemstone sapphire; trace chromia in topaz results in a sherry- color; and in the mineral tourmaline chromium and/ or vanadium causes bright green coloration, and tourmaline variety elbaite may exhibit both pink and green coloration in a single crystal ("watermelon tourmaline"). Thus, one skilled in the art would have looked to Webster for other known colorations and color schemes, such as forming bi-color effects or using other metallic species to cause other color variations. Further, in view of page 3, 23-37 of Pollak, one skilled in the art would have looked to forming color mixtures of metals/ metal oxides (including transitional metals) or plural layers to form additional aesthetic or coloration effects, per claims 14-19, 24-25 because such metals/ metal oxides are already known to cause coloration in gemstone minerals. Additionally, Pollak'145 discloses other metal/ metal oxide colorants for gemstone minerals such as topaz, sapphire, etc, e.g. copper metal or oxide, as well as iron, to produce light yellow to red coloration.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the gemstone color enhancement process of

Pollak by utilizing the additional colorants and colorations of Webster or Pollak'145 to produce additional color enhancement effects already known in art for gemstone minerals.

15. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pollak WO98/48944 in view of Starcke et al US 5853826.

Pollack is cited for the same reasons discussed above, which are incorporated herein. Use of PVD and/ or CVD to contact the color enhancing agent with the gemstone mineral is not taught.

Starcke et al teaches applying coatings to the surface of a gemstone by techniques such as PVD, CVD, and sputtering (col. 4, 55 to col. 5, 15). Gemstones (topaz, beryl, etc) are coated by the techniques using coating materials such as metals (Ti,Cr,W, etc) or metal oxides (titania, etc) to enhance the decorative appearance of the stone. While post-heating is not disclosed, since Pollak teaches on the top of page 7 that additional/ post heating treatments result in further enhancement of color (apparently due to lattice diffusion), it would have been an obvious variation to one of ordinary skill at the time the invention was made to use CVD and/ or PVD as taught by Starcke et al to contact the colorant agent with the gemstone and heat-treating as

disclosed by Pollak because of the expectation of causing desirable color enhancement of a gemstone mineral.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fred J. Parker whose telephone number is (703) 308-3474.

Fred J. Parker

May 1, 2003

FRED J. PARKER
PRIMARY EXAMINER